

## AMENDMENTS TO THE CLAIMS

**1-11. (Cancelled)**

**12. (Currently Amended)** ~~The optical fiber coupling part according to claim 11,~~ An optical fiber coupling part comprising:

an optical fiber; and

at least one GRIN lens fusion-spliced with an end of said optical fiber, said GRIN lens having a numerical aperture NA that is larger than a numerical aperture NA<sub>s</sub> of a light emitting source,  
wherein the numerical aperture NA is 0.43 or more, and a tip part of said GRIN lens is flat.

**13. (Previously Presented)** The optical fiber coupling part according to claim 12, wherein the GRIN lens has a coefficient of thermal expansion expressed by  $15 \times 10^{-7} \text{K}^{-1}$  or less, and is formed by a sol-gel method.

**14-16. (Cancelled)**

**17. (Currently Amended)** ~~The optical fiber coupling part according to claim 16,~~ An optical fiber coupling part comprising:

an optical fiber having a numerical aperture NA<sub>f</sub>

a first GRIN lens having a numerical aperture NA<sub>1</sub>; and

a second GRIN lens having a numerical aperture NA<sub>2</sub> wherein a first end of said second GRIN lens is fusion spliced with an end of said optical fiber and a second end of said second GRIN lens is fusion spliced with said first GRIN lens,

wherein a tip part of said first GRIN lens is flat, and wherein the numerical aperture  $NA_f$  of the optical fiber, the numerical aperture  $NA_1$  of the first GRIN lens, the numerical aperture  $NA_2$  of the second GRIN lens, and ~~the~~ a numerical aperture  $NA_s$  of a light emitting source are selected to satisfy the formula expressed by:

$$NA_f \leq NA_2 < NA_s \leq NA_1.$$

**18. (Previously Presented)** The optical fiber coupling part according to claim 17, wherein the numerical aperture  $NA_1$  of said first GRIN is 0.43 or more.

**19. (Previously Presented)** The optical fiber coupling part according to claim 17, wherein a length  $Z_1$  of the first GRIN lens satisfies the formula expressed by:

$$Z_1 = (n_0 * d_1 / NA_1) \arctan (d_1 / (NA_1 * L))$$

wherein a refractive index of glass at a center part of the first GRIN lens is set at  $n_0$ , a radius of the first GRIN lens is set at  $d_1$ , and a distance between the lens and the light emitting source is set at  $L$ .

**20. (Previously Presented)** The optical fiber coupling part according to claim 17, wherein said first GRIN lens and said second GRIN lens have a coefficient of thermal expansion expressed by  $15 \times 10^{-7} K^{-1}$  or less, and at least the first GRIN lens is made by a sol-gel method.

**21-29. (Cancelled)**